1. Lab #1

Presentation of the Matlab programming environment

R First, see in the lectures' part of the Laboratory manual (polycopié des TPs), the counterpart chapter of this Lab.

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1. Launch Matlab and explore the different Matlab desktop windows.
2. Do the basic calculations given in listings 1.1–1.5, and check that you get the correct answers.

Listing 1.1: Addition

```
>> 4+3
ans =
7
```

Listing 1.2: Power

```
>> 2^2
ans =
4
```

Listing 1.3: Trigonometry

```
>> sin(2*pi)+exp(-3/2)
ans =
0.2231
```

Listing 1.4: Complex numbers

```
>> 5+5j
ans =
5.0000 + 5.0000i
```

Listing 1.5: More trigonometry

```
>> atan(5/5)
ans =
0.7854

>> 10*log10(0.5)
ans =
-3.0103
```

3. *Arithmetic operations : calculate the following* :
   (a) $\frac{2^5}{2^5-1}$ and compare the result $\left(1-\frac{1}{2^5}\right)^{-1}$
   (b) $\frac{\sqrt{5}-1}{(\sqrt{5}+1)^2}$

   [*Answers : 1.0323, 1.0323, 0.1180*].

4. *Exponentials and logarithms* : *calculate the following* :
   (a) e^3
   (b) $ln(e^3)$
   (c) $log_{10}(e^3)$
   (d) $log_{10}(10^5)$

   [*Answers : 20.0855, 3, 1.3029, 5*].

5. *Trigonometric operations : calculate the following* :
   (a) $\sin(\frac{\pi}{6})$
   (b) $\cos(\pi)$
   (c) $\tan(\frac{\pi}{2})$
   (d) $\sin^2(\frac{\pi}{6}) + \cos^2(\frac{\pi}{6})$

   [*Answers : 0.5, -1, 1.6331E16, 1*].

6. *Operators' precedence* : *Use parentheses in a way that allows you to find the results given below.*
   (a) $\frac{123*456}{123+456}$.
   (b) $2 * \frac{\frac{1}{3}+\frac{1}{5}+\frac{1}{6}}{\frac{2}{3}+\frac{4}{5}+\frac{5}{6}}$.
   (c) $\frac{1}{12-6^2} + \frac{2}{3}$.
   (d) $\frac{1+(\frac{2}{3})^{\frac{1}{2}}}{12-6^2}$

   [*Answers : 97.8705, 0.6087, 0.625, -0.0757*].